CLAIMS

1. A Luneberg lens having a single-layer structure or a multilayer structure containing a plurality of layers having different dielectric constants, wherein the respective structure is produced by mixing a polyolefin resin and/or a derivative thereof with an inorganic filler having a high dielectric constant, the volume ratio of the polyolefin resin and/or the derivative thereof to the filler being 99 to 50:1 to 50, adding a foaming agent to the resulting resin mixture and then performing preliminary expansion, and molding the resulting pre-expanded beads; and wherein at least a foamed dielectric layer having a dielectric constant of 1.5 or more is formed using the pre-expanded beads that have been subjected to classification and selection such that f(A) satisfies the expression $0.0005 \leq f(A) \leq 0.1$, where f(A) is represented by the equation: $f(A) = \sigma a/Aave$, σa is the deviation of a gas volume fraction Ar in the foamed dielectric layer, and Aave is the average of the gas volume fractions Ars at positions in the foamed dielectric layer.

2. The Luneberg lens according to claim 1, wherein the inorganic filler having a high dielectric constant comprises titanium oxide, a titanate, a zirconate, or a mixture thereof.

3. The Luneberg lens according to claim 2, wherein the titanate is barium titanate, strontium titanate, calcium titanate, or magnesium titanate.

4. The Luneberg lens according to claim 1 or 2, wherein the foamed dielectric layer having a dielectric constant of 1.5 or more is formed using the pre-expanded beads classified by gravity separation or size classification.

5. A method of producing a Luneberg lens that satisfies the requirements described in claim 1, comprising the steps of:

mixing a polyolefin resin and/or a derivative thereof with an inorganic filler having a high dielectric constant, the volume ratio of the polyolefin resin and/or the derivative thereof to the filler being 99 to 50:1 to 50;

adding a foaming agent to the resulting resin mixture and then performing pre-expansion;

classifying and selecting the resulting pre-expanded beads by gravity separation or size classification; and

forming the classified and selected pre-expanded beads into a shape.